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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/510,306

03/12/2007

Jean-Noel Vallee

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EXAMINER

TANINGCO, ALEXANDER H

ART UNIT

PAPER NUMBER

2882

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/510,306	<b>Applicant(s)</b> VALLEE ET AL.	
	<b>Examiner</b> ALEXANDER H. TANINGCO	<b>Art Unit</b> 2882	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 May 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 11 April 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>03/12/2007</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Objections***

Claims 7-12 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from any other multiple claim. See MPEP § 608.01(n). Accordingly, the claims have not been further treated on the merits.

Claims 1-6 are objected to because of the following informalities:

Claim 1, line 2, delete "(100, 104, 103)"; line 3, delete "(105, 106)"; line 8, delete "(105)"; line 9, delete "(104,103)"; line 13, delete "(105)"; line 14, delete "(104,103)".

Claim 8, line 4, delete "(104, 103)"; line 8, delete "(105)".

Dependent claims 2-6 are objected to by virtue of their dependency.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, line 12, the term "optionally" is indefinite insofar as the displaying step d) requires that step c) is to be performed. Therefore, the examiner is unclear as to whether step c) is in fact optional as claimed. See MPEP 2173.05.

Claims 2 and 8 are indefinite insofar as the variables, ( $\alpha$ ,  $\beta$ ,  $\gamma$ ) and ( $x$ ,  $y$ ,  $z$ ), are not defined in the claim.

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Claim 2, line 3, "the storage means" lacks antecedent basis and is therefore indefinite.

Claim 2, line 4, "the values" lacks antecedent basis and is therefore indefinite.

Claim 2, line 7, the phrase "the read parameters" lacks antecedent basis and is therefore indefinite.

Claim 3, line 3, "the storage means" lacks antecedent basis and is therefore indefinite.

Claim 3, line 5, the phrase "according to these positions," is indefinite insofar as it is unclear as to what positions are being referenced.

Claim 3, line 6+, "the values of field of vision" lacks antecedent basis and is therefore indefinite.

Dependent claims 4-6 are rejected by virtue of their dependency.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Klotz et al. (US 5,852,646).

**With regards to claim 1**, Klotz et al. discloses a method for navigation inside a region of interest, for use in a radiography unit including an X-ray source, recording means facing the source, and a support on which an object to be radiographed,

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containing the region of interest, can be positioned, the method comprising the following steps: a) acquiring three-dimensional image data of a volume V1 of the region of interest (Abs. and Col. 4 Lines 24-30); b) calculating, at a time t, a two-dimensional projection image (IP, IP2, IP3) of all or part of volume V1 and/or a sub-volume (V2, V3, VR) of said volume V1 (Col. 2 Line 9-30) according to the position of the support, the position of the source and recording means, a field of vision (FOV), a focal distance (DF) and an object distance (DO) (Col. 3 Lines 3-15 and Col. 4 Line 16 – Col. 20); c) optionally superposing to (Col. 2 Line 34-40 and Col. 3 Line 10-50), or subtracting from the projection image (IP, IP3) and/or to the sub-volume (V3, VR), according to a given plane section, a radioscopic image (IS1) associated with the positions of the support, of the source and recording means, of the field of vision (FOV), of the focal distance (DF) and object distance (DO), at time t (Col. 5 Line 1 – Col. 6 Line 20); and d) displaying on a display device an image (IR) and/or a volume (VRS) resulting from step c), and/or the projection image (IP, IP2, IP3) and/or the sub-volume (V2, V3, VR) (Col. 2 Line 20-25).

**With regards to claim 2**, Klotz et al. discloses reading in the storage means of the radiography device a support position (x, y, z), a source and recording means position ( $\alpha$ ,  $\beta$ ,  $\gamma$ ) and the values of the field of vision (FOV), focal distance (DF) and object distance (DO); and calculating the projection image (IP, IP3) and/or sub-volume (V3, VR) according to the read parameters (Col. 3 lines 25-42, Col. 4 Lines 14-30, and Col. 6 Line 10-43).

**With regards to claim 3**, Klotz et al. discloses b1) reading in the storage means of the radiography device a support position (x, y, z) and a source and recording means

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position ( $\alpha$ ,  $\beta$ ,  $\gamma$ ) (Col. 3 lines 25-42, Col. 4 Lines 14-30, and Col. 6 Line 10-43); b2) calculating sub-volume V2 of volume V1, according to these positions (Col. 3 Line 50-55), b3) reading in the storage means of the radiography device the values of field of vision (FOV), focal distance (DF) and object distance (DO) (Col. 3 Lines 3-15 and Col. 4 Line 16 – Col. 20); b4) calculating a corrected volume V3 of sub-volume V2 according to the field of vision (FOV), the focal distance (DF) and the object distance (DO) (Col. 5 Line 50 – Col. 6 Line 50).

**With regards to claim 4**, Klotz et al. discloses correcting volume V3 is calculated as a geometric enlargement and a scaling according to the field of vision (FOV), the focal distance (DF) and the object distance (DO) (Col. 3 Line 25-45 and Col. 5 Line 1 – Col. 6 Line 20).

**With regards to claim 5**, Klotz et al. discloses during step b2), a projection image (IP2) of sub-volume V2 is also calculated according to said positions (Col. 5 Lines 1-25).

**With regards to claim 6**, Klotz et al. discloses during step b5), the projection image (IP, IP3) is generated by correcting the projection image (IP2) according to the field of vision (FOV), the focal distance (DF) and the object distance (DO) (Col. 3 Line 25-45 and Col. 5 Line 1 – Col. 6 Line 20).

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show:

**Koppe et al.** (3D Vessel Reconstruction Based on Rotational Angiography) shows geometrical transformations and calibration methods (pages 103-105).

**Navab et al.** (3D Reconstruction from Projection Matrices in a C-Arm Based 3D-Angiography System) shows a three-dimensional reconstruction from a C-arm mounted X-Ray Image Intensifier traditionally the trajectory of the source and the detector system is characterized and the pixel size is estimated. The main use of the imaging geometry characterization is to provide a correct 3D-2D mapping between the 3D voxels to be reconstructed and the 2D pixels on the radiographic images. We propose using projection matrices directly in a voxel driven backprojection for the reconstruction as opposed to that of computing all the geometrical parameters, including the imaging parameters. We discuss the simplicity of the entire calibration-reconstruction process, and the fact that it makes the computation of the pixel size, source to detector distance, and other explicit imaging parameters unnecessary (Abs.).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER H. TANDINGCO whose telephone number is (571)272-8048. The examiner can normally be reached on Mon-Fri 8:00-4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Alexander H Taningco/  
Examiner, Art Unit 2882